LISTING OF CLAIMS

1. (Original) A network comprising:

a signal source apparatus to provide information;

electromagnetic radiation generator capable of being modulated for providing electromagnetic radiation comprising non-visible radiation;

electronic circuitry for modulating the electromagnetic radiation generator;

medium through which the electromagnetic radiation passes and is transmitted;

receiver apparatus for receiving and demodulating the modulated electromagnetic radiation;

first user means for processing and making use of the information to achieve a useful functional purpose; and

second user means for achieving a useful functional purpose from said non-visible radiation said useful functional purpose being different from the purpose of said first user means.

2. (Original) The network of claim 1 in which the useful functional purpose of either the first user means or the second user means comprises communication.

3. (Original) The network of claim 1 in which the useful functional purpose of neither the first user means nor the second user means comprises communication.

4. (Original) The network of claim 1 in which the wavelength range of said non-visible radiation comprises the ultraviolet range.

5. (Original) The network of claim 1 in which the wavelength range of said non-visible radiation comprises the infrared range.

6. (Original) The network of claim 1 in which the wavelength range of said non-visible radiation comprises the radio frequency range.

7. (Original) The network of claim 1 in which the wavelength range of said non-visible radiation comprises the microwave range.

8. (Original) A method of determining a location at a structure, which comprises:

providing a lighting infrastructure having transmitters each optically transmitting a respective relative position of that transmitter with respect to a fixed position;

detecting the respective relative position of at least one of the transmitters with an optical receiver; and

determining a relative position of the receiver from the detected relative position.

9. (Original) The method according to claim 8, wherein the transmitters are selected from the group consisting of ultraviolet, infrared, and visible emission devices in the lighting infrastructure.

10. (Original) The method according to claim 8, which further comprises performing the step of determining the relative position of the receiver by determining a two-dimensional position of the receiver relative to at least one of the detected transmitters.

11. (Original) The method according to claim 8, which further comprises performing the step of determining the relative position of the receiver by determining a three-dimensional position of the receiver relative to at least one of the detected transmitters.

12. (Original) The method according to claim 8, which further comprises performing the step of determining the relative position of the receiver by comparing a received signal strength of at least one of the detected transmitters with a transmitted signal strength.

13. (Original) The method according to claim 8, which further comprises synchronously transmitting the respective relative position of the transmitters from the transmitters.

14. (Original) The method according to claim 8, which further comprises performing the step of determining the relative position of the receiver by transmitting the relative position of the detected transmitters to a central station and determining the receiver's position with the central station.

15. (Original) A method of determining a location at a structure, which comprises:

providing a lighting infrastructure having transmitters each optically transmitting a respective address;

providing a list structure associating each address with a relative position of a respective one of the transmitters with respect to a fixed position;

detecting at least one of the transmitters with an optical receiver;

determining a position of the optical receiver relative to at least one of the detected transmitters;

determining a relative position of at least one of the detected transmitters from the list structure; and

determining a relative position of the receiver from the relative position of at least one of the detected transmitters.

16. (Original) The method according to claim 15, which further comprises performing the step of determining a relative position of at least one of the detected transmitters by:

determining an identity of at least one of the detected transmitters; and

selecting a corresponding relative position from the list structure.

17. (Original) The method according to claim 15, which further comprises modulating the optical transmission of the respective address in emitted light with the transmitters and performing the step of determining the relative position of at least one of the detected transmitters by demodulating the respective address from the emitted light with the receiver.

18. (Original) The method according to claim 16, which further comprises modulating the optical transmission of the respective address in emitted light with the transmitters and performing the step of determining the identity by demodulating the respective address from the emitted light with the receiver.

19. (Original) The method according to claim 15, which comprises optically transmitting a respective unique address with each of the transmitters.

20. (Original) The method according to claim 15, which further comprises providing the list structure as part of the receiver.

21. (Original) The method according to claim 15, which further comprises locating the list structure external to the receiver, and accessing the list structure with the receiver through a transmission link.

22. (Original) The method according to claim 21, which further comprises:

providing the list structure as part of a central computer system; and

performing the accessing step by accessing the list structure with the receiver through at least one of the group consisting of a modem, an RF link, an optical link, an acoustic link, an Internet connection, a direct cellular link, the lighting infrastructure, and a satellite link.

23. (Original) The method according to claim 15, which further comprises updating the list structure to include information regarding additional transmitters added to the infrastructure, to modify information regarding existing transmitters moved to a new position, and to delete information regarding transmitters removed from the infrastructure.

24. (Original) The method according to claim 15, which further comprises performing the step of determining a relative position of at least one of the detected transmitters by performing a list structure lookup with a processor of the receiver.

25 (Original) The method according to claim 15, which further comprises performing the two steps of determining a relative position by:

forwarding the position of the receiver relative to the detected transmitters to a central station containing the list structure;

determining a relative position of at least one of the detected transmitters from the list structure stored in the central station; and

determining a relative position of the receiver from the relative position of at least one of the detected transmitters with the central station.

26. (Original) The method according to claim 25, which further comprises transmitting the relative position of the receiver from the central station to the receiver.

27. (Original) A method of determining a location at a structure, which comprises:

providing a lighting infrastructure at a structure, the infrastructure having lights and transmitters connected to the lights for optically transmitting a respective relative position of that transmitter with respect to a fixed position through emitted light;

detecting the respective relative position of at least one of the transmitters with an optical receiver; and

determining a relative position of the receiver from the detected relative position by determining at least a two-dimensional position of the receiver relative to at least one of the detected transmitters.

28. (Original) A method of determining a location at a structure, which comprises:

providing a lighting infrastructure having lights each optically transmitting a respective unique address through emitted light at a structure defining areas each having at least one of the lights;

detecting at least one of the lights with an optical receiver connected to a list structure associating each address with a relative position of a respective one of the lights with respect to a fixed position;

receiving the respective address of at least one of the detected lights with the receiver and determining an identity of at least one of the detected lights from the list structure;

performing a list structure lookup with a processor of the receiver to determine a relative position of at least one of the detected lights;

determining at least a two-dimensional position of the receiver relative to at least one of the detected lights; and

determining a relative position of the receiver from the relative position of at least one of the detected lights.

29. (Original) A method of determining a location at a structure, which comprises:

providing a lighting infrastructure having transmitters each optically transmitting a respective address;

providing a list structure associating each address with an absolute terrestrial position of a respective one of the transmitters;

detecting at least one of the transmitters with an optical receiver;

determining a position of the receiver relative to at least one of the detected transmitters;

determining an absolute terrestrial position of at least one of the detected transmitters from the list structure; and

determining an absolute terrestrial position of the receiver from the absolute terrestrial position of at least one of the detected transmitters.

30. (Original) A method of determining a location at a structure, which comprises:

providing a lighting infrastructure at a structure, the infrastructure having transmitters connected to lights optically transmitting a respective absolute terrestrial position of that transmitter through emitted light;

detecting the respective absolute terrestrial position of at least one of the transmitters with an optical receiver; and

determining a relative position of the receiver from the detected absolute terrestrial position by determining at least a two-dimensional position of the receiver relative to at least one of the detected transmitters.

31. (Original) A method of determining a location at a structure, which comprises:

providing a lighting infrastructure having lights each optically transmitting a respective unique address through emitted light at a structure defining areas each having at least one of the lights;

detecting at least one of the lights with an optical receiver connected to a list structure associating each address with an absolute terrestrial position of a respective one of the lights;

receiving the respective address of at least one of the detected lights with the receiver and determining an identity of at least one of the detected lights from the list structure;

performing a list structure lookup with a processor of the receiver to determine an absolute terrestrial position of at least one of the detected lights;

determining at least a two-dimensional position of the receiver relative to at least one of the detected lights; and

determining an absolute terrestrial position of the receiver from the absolute terrestrial position of at least one of the detected lights.

32. (Original) A method of determining a location at a structure, which comprises:

providing a lighting infrastructure having transmitters each optically transmitting a respective absolute terrestrial position of that transmitter;

detecting the respective absolute terrestrial position of at least one of the transmitters with an optical receiver; and

determining a absolute terrestrial position of the receiver from the detected absolute terrestrial position.

33. (Original) An optically-based location system, comprising:

a lighting infrastructure having optical transmitters each configured to illuminate and to transmit a respective relative position of said transmitters with respect to a fixed position; and

an optical receiver configured to detect at least one of said transmitters and to determine from the detection a relative position of said receiver.

34. (Original) The system according to claim 33, wherein said lighting infrastructure is inside a structure.

35. (Original) The system according to claim 33, wherein said transmitters are lights in said lighting infrastructure.

36. (Original) The system according to claim 33, wherein said lighting infrastructure includes fluorescent lights each with a ballast, and each of said transmitters is part of a ballast of said fluorescent lights.

37. (Original) The system according to claim 33, wherein said transmitters are configured to transmit said respective relative position through emitted light.

38. (Original) The system according to claim 33, wherein said transmitters are configured to transmit said respective relative position through modulation of emitted light and said receiver is configured to demodulate said respective relative position from the emitted light.

39. (Original) The system according to claim 33, wherein each of said transmitters is a fluorescent light controlled by a unique ballast effecting a periodic transmission of said respective relative position through emitted fluorescent light.

40. (Original) The system according to claim 39, wherein said unique ballast is configured to control power supplied to said fluorescent light for varying illumination into a form recognized by said receiver as said respective relative position.

41. (Original) The system according to claim 33, wherein said unique ballast is configured to modulate illumination from said fluorescent light into a form recognized by said receiver as said respective relative position.

42. (Original) The system according to claim 33, wherein said transmitters have a transmit signal strength and said receiver has an optical power detector for detecting a received signal strength and for comparing said received signal strength to said transmit signal strength to form a distance measurement.

43. (Original) The system according to claim 33, wherein said receiver is portable.

44. (Original) The system according to claim 33, wherein said receiver is located in a device selected from the group consisting of a piece of jewelry, a cellular telephone, and a portable computing device.

45. (Original) The system according to claim 44, wherein said portable computing device is one of the group consisting of a laptop computer and a personal digital assistant.

46. (Original) The system according to claim 33, including a display connected to said receiver for showing a relative position of said receiver.

47. (Original) The system according to claim 33, wherein said receiver has a display for showing a relative position of said receiver.

48. (Original) The system according to claim 33, wherein said receiver has at least one of the group consisting of a silicon detector, a GaAs detector, a charged couple device detector, and a charged couple device detector array.

49. (Original) The system according to claim 33, including a central station coupled to said optical receiver, said central station configured to determine a relative position of said optical receiver from at least one of said transmitters detected by said optical receiver.

50. (Original) The system according to claim 49, wherein said central station is coupled to said optical receiver through at least one of the group consisting of a modem, an RF link, an optical link, an acoustic link, an Internet connection, a direct cellular link, the lighting infrastructure, and a satellite link.

51. (Original) An optically-based location system, comprising:

a lighting infrastructure having optical transmitters each configured to illuminate and to transmit a respective address;

a list structure having a table associating each address of said transmitters with a relative position of each respective one of said transmitters with respect to a fixed position; and

an optical receiver configured to detect at least one of said transmitters and to determine from a detection a relative position of said receiver.

52. (Original) The system according to claim 51, wherein said receiver has a detector and a processor connected to said list structure and to said detector, said processor configured to determine a relative position of said receiver by executing the steps of:

detecting at least one of said transmitters and a transmitted respective address of said at least one of said transmitters with said receiver;

determining a relative position of said receiver with respect to said at least one of said transmitters detected;

accessing said list structure with said processor using said addresses detected to obtain a relative position of said at least one of said transmitters stored in said list structure; and

correcting said relative position of said receiver using said relative position of said at least one of said transmitters to obtain a relative position of said receiver.

53. (Original) The system according to claim 51, wherein each of said transmitters is a fluorescent light controlled by a unique ballast effecting a periodic transmission of said address through emitted fluorescent light and said unique ballast controls power supplied to said fluorescent light for varying illumination into a form recognized by said receiver as said unique address.

54. (Original) The system according to claim 51, wherein said list structure is part of said receiver.

55. (Original) The system according to claim 51, wherein said list structure is external to said receiver and said receiver is coupled to said list structure through a transmission link.

56. (Cancelled)

57. (Original) The system according to claim 51, wherein said list structure is to be updated to add information to said table regarding new transmitters added to said infrastructure, to modify information in said table regarding existing transmitters moved to a new position in said infrastructure, and to delete information in said table regarding transmitters removed from said infrastructure.

58. (Original) An optically-based location system, comprising:

a lighting infrastructure at a structure having lights each configured to illuminate and to transmit a respective address through modulation of emitted light;

a list structure having a table associating each address of said lights with a relative position of each respective one of said lights; and

an optical receiver configured to detect at least one of said lights, to demodulate said respective address from the emitted light, and to determine from the detection a relative position of said receiver, said receiver having a detector and a processor connected to said list structure and to said detector, said processor configured to determine a relative position of said receiver by executing the steps of:

detecting at least one of said lights and a transmitted respective address of said at least one of said lights with said receiver;

determining a relative position of said receiver with respect to said at least one of said lights detected;

accessing said list structure with said processor using a detected transmitted respective address to obtain a relative position of said at least one of said lights stored in said list structure; and

correcting said relative position of said receiver using said relative position of said at least one of said lights to obtain a relative position of said receiver.

59. (Original) An optically-based location system, comprising:

a lighting infrastructure having optical transmitters each configured to illuminate and to transmit a respective absolute terrestrial position of said transmitters;

an optical receiver configured to detect at least one of said transmitters and to determine from the detection an absolute terrestrial position of said receiver.

60. (Original) An optically-based location system, comprising:

a lighting infrastructure having optical transmitters each configured to illuminate and to transmit a respective address;

a list structure having a table associating each address of said transmitters with an absolute terrestrial position of each respective one of said transmitters; and

an optical receiver configured to detect at least one of said transmitters and to determine from a detection an absolute terrestrial position of said receiver.

61. (Original) An optically-based location system, comprising:

a lighting infrastructure at a structure having lights each configured to illuminate and to transmit a respective address through modulation of emitted light;

a list structure having a table associating each address of said lights with an absolute terrestrial position of each respective one of said lights; and

an optical receiver configured to detect at least one of said lights, to demodulate said respective address from the emitted light, and to determine from the detection an absolute terrestrial position of said receiver, said receiver having a detector and a processor connected to said list structure and to said detector, said processor configured to determine an absolute terrestrial position of said receiver by executing the steps of:

detecting at least one of said lights and a transmitted respective address of said at least one of said lights with said receiver;

determining a relative position of said receiver with respect to said at least one of said lights detected;

accessing said list structure with said processor using a detected transmitted respective address to obtain an absolute terrestrial position of said at least one of said lights stored in said list structure; and

correcting said relative position of said receiver using said absolute terrestrial position of said at least one of said lights to obtain an absolute terrestrial position of said receiver.

62. (Original)An optically-based in-building location system, comprising:

a lighting infrastructure having optical transmitters each configured to illuminate and to transmit a respective address signal; and

an optical receiver configured to:

decode the respective address of at least one of said transmitters,

determine one of a distance and a position relative to said at least one transmitter from one or more measurements of the address signal, and

transmit a position signal that includes the determined distance or relative position.

63. (Original) The system according to claim 62, further comprising a central receiver control station that receives the position signal and determines one of the absolute terrestrial position, or a position relative to another coordinate system.

64. (Original)The method of claims 8 wherein at least on of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variation, the variations resulting from data transmission and being imperceptible to the human eye.

65. (Original) The method of claim 15 wherein at least on of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

66. (Original) The method of claim 27 wherein at least on of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

67. (Original) The method of claim 28 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

68. (Original) The method of claim 29 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

69. (Original) The method of claim 30 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

70. (Original) The method of claim 31 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

71. (Original) The method of claim 32 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

72. (Original) The system of claim 33 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

73. (Original) The system of claim 51 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and

electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

74. (Original) The system of claim 58 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

75. (Original) The system of claim 59 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

76. (Original) The system of claim 60 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

77. (Original) The system of claim 61 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

78. (Original) The system of claim 62 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.

79. (Original)The system of claim 63 wherein at least in of the lights comprises a visible light assembly that emits visible light capable of providing illumination and electronically

detectable variations, the variations resulting from data transmission and being imperceptible to the human eye.